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EXAMINER	
STAICOVICI, STEFAN	

ART UNIT	PAPER NUMBER
1732	11

DATE MAILED: 08/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

MK-11

Office Action Summary	Application No.	Applicant(s)	
	09/689,131	HETZEL,, JOHN M.	
	Examiner	Art Unit	
	Stefan Staicovici	1732	

-- The MAILING DATE of this communication appears on the c ver sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 May 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-64* is/are pending in the application.

4a) Of the above claim(s) *38-41 and 59* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-37, 42-58 and 60-64* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed May 30, 2003 (Paper No. 10) has been entered. Claims 3-4, 25-26, 44-45 and 58 have been amended. No claims have been canceled. New claims 60-64 have been added. Claims 1-64 are pending in the instant application.

Election/Restrictions

2. This application contains claims 38-41 and 59 drawn to a nonelected invention. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01. It should be noted that under MPEP §2113:

> "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Claims 38-41 and 59 remain withdrawn from consideration.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 60-64 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In claims 60-64, the limitation of a thermosetting resin that "is *not* a urea-based resin" (emphasis added) does not appear to have support in the original disclosure. Although the original disclosure does not mention an urea-based thermosetting resin, the original disclosure does not specifically describe or even suggest the negative limitation of a thermosetting resin that "is *not* a urea-based resin" (emphasis added).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1, 8, 11, 17, 42, 49, 52, 56-57, 60-61 and 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Medwell (US Patent No. 4,656,674) in view of JP 1-145106 and in further view of Fujino *et al.* (US Patent No. 5,630,230).

Medwell ('674) teaches the basic claimed process of forming a protective helmet including, providing a thermosetting resin impregnated fabric (fiber-based filler), positioning

said thermosetting resin impregnated fabric into a mold having a male and a female mold half and molding said thermosetting resin impregnated fabric into a protective helmet under heat and pressure by curing said thermosetting resin (see col. 2, line 65 through col. 3, line 14).

Regarding claims 1, 17 and 42, Medwell ('674) do not teach a thermosetting resin impregnated fabric having ceramic particles mixed therein. JP 1-145106 teach a process for molding a ceramic sheet including, mixing ceramic particles with a thermosetting resin, impregnating a fibrous sheet with said mixture and molding said impregnated fibrous sheet under heat and pressure. Fujino *et al.* ('230) teach that a high polymer mixed with ceramic mixture provides increased protection from infrared radiation (see col. 1, lines 5-15 and col. 3, lines 23-28). Therefore, in view of Fujino *et al.* ('230) it would have been obvious for one of ordinary skill in the art to have provided a thermosetting resin impregnated fabric having ceramic particles mixed therein as taught by JP 1-145106 in the process of Medwell ('674) because, Fujino et al. ('230) specifically teach that a high polymer mixed with ceramic mixture provides increased protection from infrared radiation, hence improving the protective characteristics of the resulting molded helmet.

In regard to claims 8 and 49, Medwell ('674) teaches a polyester thermosetting resin (see col. 3, lines 9-14).

Specifically regarding claims 11 and 52, Medwell ('674) teaches polyaramid fibers (see col. 3, lines 5-9).

Regarding claims 56-57, it is submitted that after curing, said thermosetting resin is rigid. Further, it is submitted that the protective helmet Medwell ('674) meets the NFP Standards in order to function as described.

In regard to claims 60-61 and 64, Medwell ('674) teaches a phenolic resin, a polyester resin or a thermoplastic resin (see col. 3, lines 10-12). It is submitted that a phenolic resin, a polyester resin or a thermoplastic resin is not a urea-based thermosetting resin.

7. Claims 9-10 and 50-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over unpatentable over Medwell (US Patent No. 4,656,674) in view of JP 1-145106 and in further view of Fujino *et al.* (US Patent No. 5,630,230) and Hetzel, Jr. *et al.* (US Patent No. 6,098,197197).

Medwell ('674) in view of JP 1-145106 and in further view of Fujino *et al.* ('230) teach the basic claimed process as described above.

Regarding claims 9 and 50, Medwell ('674) in view of JP 1-145106 do not teach a vinyl ester thermosetting resin. Hetzel, Jr. *et al.* ('197) a process for making a protective helmet including, providing a male (26) and a female (28) mold, positioning a fiber reinforced sheet (16) in said female mold (28), pouring a thermosetting resin (18) onto said fiber reinforced sheet (16), closing said male mold onto said female mold and curing under heat and pressure said resin to form a protective helmet (see col. 6, lines 41-60 and Figure 6). Further, Hetzel, Jr. *et al.* ('197) teach that polyester and vinyl ester are equivalent alternatives for molding a protective helmet (see col. 3, lines 9-14). Therefore, it would have been obvious for one of ordinary skill in the art to have provided a vinyl ester thermosetting resin as taught by Hetzel, Jr. *et al.* ('197) in the

process of Medwell ('674) in view of JP 1-145106 and in further view of Fujino *et al.* ('230), because Hetzel, Jr. *et al.* ('197) specifically teach that polyester and vinyl ester thermosetting resins are equivalent alternatives for molding a protective helmet.

In regard to claims 10 and 51, Hetzel, Jr. *et al.* ('197) teach that a vinyl ester thermosetting resin includes a catalyst, hence it is submitted that said catalyst was applied prior to impregnating said fibrous sheet with said thermosetting resin (see col. 6, lines 44-46). Therefore, it would have been obvious for one of ordinary skill in the art to have added a catalyst vinyl ester to a thermosetting resin as taught by Hetzel, Jr. *et al.* ('197) in the process of Medwell ('674) in view of JP 1-145106 and in further view of Fujino *et al.* ('230), because Hetzel, Jr. *et al.* ('197) specifically teach that polyester and vinyl ester thermosetting resins are equivalent alternatives for molding a protective helmet.

8. Claims 12-13, 15 and 53-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Medwell (US Patent No. 4,656,674) in view of JP 1-145106 and in further view of Fujino *et al.* (US Patent No. 5,630,230) and Hastings (US Patent No. 5,794,271).

Medwell ('674) in view of JP 1-145106 and in further view of Fujino *et al.* ('230) teach the basic claimed process as described above.

Regarding claims 12-13, 15 and 53-55, although Medwell ('674) teaches providing additional reinforcement layers (see col. 2, lines 60-65), Medwell ('674) does not specifically teach a fiber-based sheeting, especially a woven/non-woven glass fiber sheeting. Hastings ('271) teaches a polymeric protective helmet including, providing a non-woven glass fiber layer (32) (see col. 3, lines 6-20 and Figure 3). Therefore, it would have been obvious for one of ordinary

skill in the art to have provided a fiber-based sheeting, especially a non-woven glass fiber sheeting as taught by Hastings ('271) in the protective helmet formed by the process of Medwell ('674) in view of JP 1-145106 and in further view of Fujino *et al.* ('230) because, Hastings ('271) specifically teaches that such a sheeting provides for improved impact resistance, Medwell ('674) and Hastings ('271) teach similar end-products.

9. Claims 1, 5, 8, 11-13, 15-19, 23, 27, 33-36, 42, 46, 49, 52-57 and 62-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hastings (US Patent No. 5,794,271) in view of JP 1-145106 and in further view of Fujino *et al.* (US Patent No. 5,630,230).

Hastings ('271) teaches the basic claimed process of forming a protective helmet including providing a first layer of thermosetting resin (18) on a mold surface, placing a second layer including a fiber reinforced woven fabric (20) over said first layer of thermosetting resin (18), positioning a third layer of said thermosetting resin (22) and molding (curing thermosetting resin) said layers to form said protective helmet (see col. 2, lines 38-65). It is submitted that since Hastings ('271) teaches a molding process that a female and a male mold are taught in order to obtain a molded article as shown in Figure 1.

Regarding claims 1, 17, 23, 36 and 42, Hastings ('271) does not teach a thermosetting resin impregnated fabric having ceramic particles mixed therein. JP 1-145106 teach a process for molding a ceramic sheet including, mixing ceramic particles with a thermosetting resin, impregnating a fibrous sheet with said mixture and molding said impregnated fibrous sheet under heat and pressure. Fujino *et al.* ('230) teach that a high polymer mixed with ceramic mixture provides increased protection from infrared radiation (see col. 1, lines 5-15 and col. 3, lines 23-

28). Therefore, in view of Fujino *et al.* ('230) it would have been obvious for one of ordinary skill in the art to have provided a thermosetting resin impregnated fabric having ceramic particles mixed therein as taught by JP 1-145106 in the process of Hastings ('271) because, Fujino et al. ('230) specifically teach that a high polymer mixed with ceramic mixture provides increased protection from infrared radiation, hence improving the protective characteristics of the resulting molded helmet.

Further regarding claims 18-19, 23 and 36, it should be noted that Hastings ('271) teaches a first thermosetting resin layer (18), a fiber layer (20) and a second thermosetting layer (22) placed onto said fiber layer (20).

In regard to claims 5, 27 and 46, Hastings ('271) teaches that the epoxy layer penetrates second layer (20) to completely saturate said second layer (20) (see col. 2, line 66 through col. 3, line 5). Further, upon curing, it is submitted that "complete saturation" requires that the epoxy resin flow around the fibers and bond to the fibers during the curing process.

In regard to claims 8 and 49, Hastings ('271) teaches an epoxy thermosetting resin (see col. 2, lines 41-42).

Specifically regarding claims 11 and 52, Hastings ('271) teaches aramid fibers (see col. 2, lines 50-51).

Regarding claims 12-13, 15, 33-35 and 53-55, Hastings ('271) teaches a polymeric protective helmet having a non-woven glass fiber layer (32) bonded to woven fiber layer (20) (see col. 3, lines 6-20 and Figure 3).

In regard to claim 16, Hastings ('271) teaches placing a fiber layer (20) onto a first resin layer (18) and then placing a second resin layer (22) onto said fiber layer (20). Hence, it is submitted that said fiber layer (20) is positioned in the mold prior to resin impregnation.

Regarding claims 56-57, it is submitted that after curing, said thermosetting resin is rigid. Further, it is submitted that the protective helmet of Hastings ('271) meets the NFP Standards in order to function as described.

In regard to claims 62-63, Hastings ('271) teaches an epoxy thermosetting resin (see col. 2, line 39). It is submitted that an epoxy resin is not a urea-based thermosetting resin.

10. Claims 2, 20, 24, 37 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hastings (US Patent No. 5,794,271) in view of JP 1-145106 and in further view of Fujino *et al.* (US Patent No. 5,630,230) and JP 55-3320.

Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230) teach the basic claimed process as described above.

Regarding claims 2, 20, 24, 37 and 43, Hastings ('271)in view of JP 1-145106 and in further view of Fujino *et al.* ('230) do not teach chopping the ceramic particles. JP 55-3320 teaches forming ceramic particles by grinding (chopping) a ceramic blank. Therefore, it would have been obvious for one of ordinary skill in the art to have formed ceramic particles by grinding (chopping) a blank as taught by JP 55-3320 in the process of Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230) because, JP 55-3320specifically teaches forming ceramic particles by grinding, whereas JP 1-145106 teaches a process for impregnating a fabric with a mixture containing ceramic particles and thermosetting resin. Further, it should be

noted that Fujino *et al.* ('230) specifically teach that a high polymer mixed with ceramic mixture provides increased protection from infrared radiation (see col. 1, lines 5-15 and col. 3, lines 23-28).

11. Claims 3-4, 21-22, 44-45 and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hastings (US Patent No. 5,794,271) in view of JP 1-145106 and in further view of Fujino *et al.* (US Patent No. 5,630,230) and JP 11-322459.

Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230) teach the basic claimed process as described above.

Regarding claims 4, 22 and 45, Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230) do not teach a ceramic content of 10 to 20 percent by weight. JP 11-322459 teaches a moldable mixture of thermosetting resin and ceramic particles in a content of 5-30 percent by volume (approximately 10 to approximately 20 percent by weight). Therefore, it would have been obvious for one of ordinary skill in the art to have provided a moldable thermosetting resin and ceramic particles in a content of 5-30 percent by volume as taught by JP 11-322459 in the process of Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230) because, JP 1-145106 specifically teaches a moldable mixture of thermosetting resin and ceramic particles. Further, it should be noted that the ceramic content is a result-effective variables. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Therefore, it would have been obvious for one of ordinary skill in the art to have determined an optimum ceramic particle size in the process of Hastings ('271) in view of JP 1-145106 and in further

view of Fujino *et al.* ('230) and JP 1-145106 due to a variety of unclaimed parameters such as thermosetting resin type, final desirable characteristics, etc.

In regard to claims 3, 21, 44 and 58, it is submitted that particle size is are result-effective variables. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Therefore, it would have been obvious for one of ordinary skill in the art to have determined an optimum ceramic particle size in the process of Hastings ('271) in view of JP 1-145106 and in further view of JP 1-145106 due to a variety of unclaimed parameters such as thermosetting resin type, final desirable characteristics, etc.

Further regarding claims 3-4, 44-45 and 58, the process of Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230) and JP 11-322459 teaches that a high polymer mixed with ceramic mixture provides increased protection from infrared radiation (heat reflectivity) and as such, a protective helmet will also provide increased protection from infrared radiation (heat reflectivity). It is submitted that a helmet to function as a protective helmet must provide heat reflectivity because if heat radiation is either absorbed or transmitted the helmet cannot function as a protective helmet.

12. Claims 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hastings (US Patent No. 5,794,271) in view of JP 1-145106 and in further view of Fujino *et al.* (US Patent No. 5,630,230), JP 55-3320 and JP 11-322459.

Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230) and JP 55-3320 teach the basic claimed process as described above.

Regarding claim 26, Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230) and JP 55-3320 do not teach a ceramic content of 10 to 20 percent by weight. JP 11-322459 teaches a moldable mixture of thermosetting resin and ceramic particles in a content of 5-30 percent by volume (approximately 10 to approximately 20 percent by weight). Therefore, it would have been obvious for one of ordinary skill in the art to have provided a moldable thermosetting resin and ceramic particles in a content of 5-30 percent by volume as taught by JP 11-322459 in the process of Hastings ('271) in view of JP 1-145106 and in further view of JP 55-3320 because, JP 1-145106 specifically teaches a moldable mixture of thermosetting resin and ceramic particles. Further, it should be noted that the ceramic content is a result-effective variables. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Therefore, it would have been obvious for one of ordinary skill in the art to have determined an optimum ceramic particle size in the process of Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230), JP 55-3320 and JP 11-322459, due to a variety of unclaimed parameters such as thermosetting resin type, final desirable characteristics, etc.

In regard to claim 25, it is submitted that particle size is are result-effective variables. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Therefore, it would have been obvious for one of ordinary skill in the art to have determined an optimum ceramic particle size in the process of Hastings ('271) in view of JP 1-145106 and in further view of JP 55-3320 and JP 11-322459 due to a variety of unclaimed parameters such as thermosetting resin type, final desirable characteristics, etc.

Further regarding claims 25-26, the process of Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230), JP 55-3320 and JP 11-322459 teaches that a high polymer mixed with ceramic mixture provides increased protection from infrared radiation (heat reflectivity) and as such, a protective helmet will also provide increased protection from infrared radiation (heat reflectivity). It is submitted that a helmet to function as a protective helmet must provide heat reflectivity because if heat radiation is either absorbed or transmitted the helmet cannot function as a protective helmet.

13. Claims 6-7, 9-10, 14, 28-32, 47-48, 50-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hastings (US Patent No. 5,794,271) in view of JP 1-145106 and in further view of Fujino *et al.* (US Patent No. 5,630,230) and Hetzel, Jr. *et al.* (US Patent No. 6,098,197197).

Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230) teach the basic claimed process as described above.

Regarding claims 9, 31 and 50, Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230) do not teach a vinyl ester thermosetting resin. Hetzel, Jr. *et al.* ('197) a process for making a protective helmet including, providing a male (26) and a female (28) mold, positioning a fiber reinforced sheet (16) in said female mold (28), pouring a thermosetting resin (18) onto said fiber reinforced sheet (16), closing said male mold onto said female mold and curing under heat and pressure said resin to form a protective helmet (see col. 6, lines 41-60 and Figure 6). Further, Hetzel, Jr. *et al.* ('197) teach that polyester and vinyl ester are equivalent alternatives for molding a protective helmet (see col. 3, lines 9-14). Therefore, it would have

been obvious for one of ordinary skill in the art to have provided a vinyl ester thermosetting resin as taught by Hetzel, Jr. *et al.* ('197) in the process of Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230), because Hetzel, Jr. *et al.* ('197) specifically teach that polyester and vinyl ester thermosetting resins are equivalent alternatives for molding a protective helmet.

In regard to claims 10, 30, 32 and 51, Hetzel, Jr. *et al.* ('197) teach that a vinyl ester thermosetting resin includes a catalyst, hence it is submitted that said catalyst was applied prior to impregnating said fibrous sheet with said thermosetting resin (see col. 6, lines 44-46). Therefore, it would have been obvious for one of ordinary skill in the art to have added a catalyst vinyl ester to a thermosetting resin as taught by Hetzel, Jr. *et al.* ('197) in the process of Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230), because Hetzel, Jr. *et al.* ('197) specifically teach that polyester and vinyl ester thermosetting resins are equivalent alternatives for molding a protective helmet. Further regarding claim 30, it should be noted that Hastings ('271) teaches an epoxy thermosetting resin (see col. 2, lines 41-42). It should be noted that in claim 32, it is submitted that the catalyst is mixed with the thermosetting resin prior to being molded in order to allow homogeneous distribution of said catalyst within said thermosetting resin and as such to function as described by Hetzel, Jr. *et al.* ('197).

Specifically regarding claim 14, Hetzel, Jr. *et al.* ('197) teach a firefighter helmet having a thickness of 0.08 inches (approximately 0.09 inches) (col. 5, line 37). It would have been obvious for one of ordinary skill to have provided a fibrous layer having a thickness of approximately 0.09 inches (0.08 inches) as taught by Hetzel, Jr. *et al.* ('197) in the process of

Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230), because Hetzel, Jr. *et al.* ('197) specifically teach that such a thickness is desirable for a protective helmet which is taught by Hastings ('271).

Regarding claims 6-7, 28-29, 47-48, it is submitted that molding time, temperature and pressure are result-effective variables. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Further, it should be noted that Hetzel, Jr. *et al.* ('197) teach a molding temperature of 100 to 200 °F, a molding pressure of 300 to 500 psi and a molding time of 6-9 minutes (see col. 6, lines 57-68). Therefore, it would have been obvious for one of ordinary skill in the art to have determined an optimum molding temperature, pressure and time as taught by Hetzel, Jr. *et al.* ('197) in the process of Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230) because, Hetzel, Jr. *et al.* ('197) teach molding (curing) conditions for an epoxy thermosetting resin which is the material taught by Hastings ('271).

Response to Arguments

14. Applicant's remarks filed May 30, 2003 (Paper No. 10) have been considered.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant argues that the "Office action takes the position that the Fujino patent teaches that one of ordinary skill in the art would use the fabric of the Japanese '106 reference in the

helmet of the Medwell reference" (see page 4 of the amendment filed May 30, 2003). Further, Applicant argues that "the Office action had not supplied a sufficient motivation for the proposed combination of the Japanese and Medwell references" (see page 4 of the amendment filed May 30, 2003).

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the primary reference of Medwell ('674) teaches a process of forming a protective helmet including, providing a thermosetting resin impregnated fabric (fiber-based filler), positioning said thermosetting resin impregnated fabric into a mold having a male and a female mold half and molding said thermosetting resin impregnated fabric into a protective helmet

under heat and pressure by curing said thermosetting resin (see col. 2, line 65 through col. 3, line 14). The secondary reference of JP 1-145106 teaches a process for molding a ceramic sheet including, mixing ceramic particles with a thermosetting resin, impregnating a fibrous sheet with said mixture and molding said impregnated fibrous sheet under heat and pressure. The secondary reference of Fujino *et al.* ('230) teach that a high polymer mixed with ceramic mixture provides increased protection from infrared radiation (see col. 1, lines 5-15 and col. 3, lines 23-28). Therefore, in view of Fujino *et al.* ('230) it would have been obvious for one of ordinary skill in the art to have provided a thermosetting resin impregnated fabric having ceramic particles mixed therein as taught by JP 1-145106 in the process of Medwell ('674) because, Fujino et al. ('230) specifically teach that a high polymer mixed with ceramic mixture provides increased protection from infrared radiation, hence improving the protective characteristics of the resulting molded helmet.

Applicant argues that Fujino *et al.* ('230) is "directed to different technology that does not correspond to the technology of the Medwell and Japanese '106 reference" (see page 5 of the amendment filed May 30, 2003). Further, Applicant argues that the "Fujino reference does not teach the use of a resin impregnated with a ceramic powder in a helmet making process" (see page 6 of the amendment filed May 30, 2003). In response, under MPEP §2144, the rationale to modify or combine the prior art "may be expressly or impliedly contained in the prior art or it may be reasoned from knowledge generally available to one of ordinary skill in the art, established scientific principles, or legal precedent established by prior case law." In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Further, MPEP §2144 states that the "*strongest*

rationale for combining references is a *recognition*, expressly or impliedly in the prior art or drawn from a convincing line of reasoning based on established scientific principles or legal precedent, that *some advantage or expected beneficial result* would have been produced by their combination" (emphasis added). In re Sernaker, 702 F.2d 989, 994-95, 217 USPQ 1, 5-6 (Fed. Cir. 1983). Furthermore, MPEP §2144 states that it "is not necessary that the prior art suggest the combination to achieve the same advantage or result discovered by applicant" (emphasis added). In re Linter, 458 F.2d 1013, 173 USPQ 560 (CCPA 1972). In the instant case, Fujino *et al.* ('230) specifically teach that a high polymer mixed with ceramic mixture provides increased protection from infrared radiation (see col. 1, lines 5-15 and col. 3, lines 23-28). It is submitted that motivation has been provided by the teachings of Fujino *et al.* ('230) to combine the teachings of Medwell ('674) and JP 1-145106 such that, in view of Fujino *et al.* ('230) it would have been obvious for one of ordinary skill in the art to have provided a thermosetting resin impregnated fabric having ceramic particles mixed therein as taught by JP 1-145106 in the process of Medwell ('674) because, Fujino et al. ('230) specifically teach that a high polymer mixed with ceramic mixture provides increased protection from infrared radiation, hence improving the protective characteristics of the resulting molded helmet. Furthermore, it should be noted that in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., shape, structure, fashion of ceramic powder) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant argues that "the Fujino reference does not disclose the use of ceramic particles to provide protection from infrared radiation" (see page 7 of the amendment filed May 30, 2003). In response, Fujino *et al.* ('230) specifically teach in col. 1, lines 5-15 and col. 3, lines 23-28 that a high polymer mixed with a ceramic mixture provides increased protection from infrared radiation, said ceramic mixture including fine powder ceramic, such as alumina, silica or zirconium carbonate. Further, it should be noted that a thermosetting polymer is a "high molecular polymer."

Applicant argues that the "Medwell and Japanese '106 references cannot be combined in the proposed manner" because the "resultant structure would be unstable, susceptible to fracture, and not suitable for use in moist conditions" (see pages 7-9 of the amendment filed May 30, 2003). In response it should be noted that that the teachings of JP 1-145106 were used to merely show that mixing ceramic particles with a thermosetting resin is a known process to a person ordinarily skilled. Further, the teachings of Fujino *et al.* ('230) were used to show that a high polymer mixed with a ceramic mixture, said ceramic mixture including ceramic powder (*i.e.*, alumina, silica or zirconium carbonate) provides increased protection from infrared radiation and as such, provide motivation to combine the teachings of Medwell ('674) and JP 1-145106.

Applicant argues that "the Office action does not propose impregnating the epoxy resins 18, 20 of the Hastings reference with ceramic particles" (see page 10 of the amendment filed May 30, 2003). However, in the Office Action mailed February 28, 2003 (Paper No. 9), the Office action clearly states that Hastings ('271) teaches a process of forming a protective helmet including providing a first layer of thermosetting resin (18) on a mold surface, placing a second

layer including a fiber reinforced woven fabric (20) over said first layer of thermosetting resin (18), positioning a third layer of said thermosetting resin (22) and molding (curing thermosetting resin) said layers to form said protective helmet (see col. 2, lines 38-65). Further, it is stated that JP 1-145106 teach a process for molding a ceramic sheet including, mixing ceramic particles with a thermosetting resin, impregnating a fibrous sheet with said mixture and molding said impregnated fibrous sheet under heat and pressure. Fujino *et al.* ('230) teach that a high polymer mixed with ceramic mixture provides increased protection from infrared radiation (see col. 1, lines 5-15 and col. 3, lines 23-28). Therefore, in view of Fujino *et al.* ('230) it would have been obvious for one of ordinary skill in the art to have provided a thermosetting resin impregnated fabric having ceramic particles mixed therein as taught by JP 1-145106 in the process of Hastings ('271) because, Fujino et al. ('230) specifically teach that a high polymer mixed with ceramic mixture provides increased protection from infrared radiation, hence improving the protective characteristics of the resulting molded helmet. The Office action then states that Hastings ('271) teaches a first thermosetting resin layer (18), a fiber layer (20) and a second thermosetting layer (22) placed onto said fiber layer (20). Since the process of Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230) teach a thermosetting resin that is mixed with ceramic particles, it is submitted that "the epoxy resins 18, 20 of the Hastings reference" are impregnated with ceramic particles.

Applicant argues that JP 55-3320 does not teach "chopping" ceramic particles because "grinding" and "chopping" are different processes (see page 11 of the amendment filed May 30, 2003). However, under MPEP §2111.01, when "not defined by applicant in the specification, the

words of a claim must be given their plain meaning. In other words, they must be read as they would be interpreted by those of ordinary skill in the art. Rexnord Corp. v. Laitram Corp., 274 F.3d 1336, 1342, 60 USPQ2d 1851, 1854 (Fed. Cir. 2001). Therefore, both "grinding" and "chopping" of a ceramic block results in ceramic particles.

Applicant argues that "5-30% by volume" is different from "approximately 10 to approximately 20% by weight value" because "percentage by volume does not translate into percentage by weight" (see page 11 of the amendment filed May 30, 2003). In response, it should be noted that the Office Action mailed February 28, 2003 (Paper No. 9) submitted that 5-30% by volume" is equivalent to "approximately 10 to approximately 20% by weight value" because under known values of density and particle size the percentage by volume can be translated into percentage by weight. Further, it should be noted that the features upon which applicant relies (i.e., even distribution of particles due to particle size) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant argues that the helmet of the "Medwell reference as modified by the Japanese '106 reference" does not meet NFPA standards because the "Japanese '106" reference used an urea-based resin (see page 13 of the amendment filed May 30, 2003). In response, it is noted that the teachings of JP 1-145106 were used to merely show that mixing ceramic particles with a thermosetting resin is a known process to a person ordinarily skilled and not to show a helmet that meets NFPA standards.

Applicant argues that the "Hastings reference...does not provide support" for impregnating a fiber layer after being positioned in a mold (see pages 13-14 of the amendment filed May 30, 2003). In response, Hastings ('271) specifically teaches placing a fiber layer (20) onto a first resin layer (18) and then placing a second resin layer (22) onto said fiber layer (20) because, Hastings ('271) teaches that fiber layer (20) is placed "above" first resin layer (18) and second resin layer is placed "above" fiber layer (20) (see col. 2, lines 52-59). Hence, it is submitted that said fiber layer (20) is positioned in the mold prior to resin impregnation.

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stefan Staicovici, Ph.D. whose telephone number is (703) 305-0396. The examiner can normally be reached on Monday-Friday 8:00 AM to 5:30 PM and alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael P. Colaianni, can be reached at (703) 305-5493. The fax phone number for this Group is (703) 305-7718.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

Stefan Staicovici, PhD

Primary Examiner 8/6/03

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August 6, 2003